Victoria (Tori) Gobo

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Education

Colgate University | Hamilton, NY   **May 2022**
Bachelor of Arts; Cumulative GPA: 3.50/4.00 *(Magnum Cum Laude)*
Major: Neuroscience; Minor: Computer Science
Thesis: *Brain-Supervised Sparse Reconstruction of Goal-Driven Perceptual Representations.*

Research Experience

Section on Functional Imaging Methods - Post-Baccalaureate IRTA, NIMH   **Jul.2022-Present**
Principal Investigator: Peter Bandettini, PhD
Advisor: Sharif Kronemer, PhD
Main Question: How does spontaneous changes in pupil size correlate with perception and brain activity?
- Pioneered a method to track changes in pupil size in real-time to use as a marker for changes in arousal.
- Recruited health participants and stroke patients and collected data using a variety of methods such as eye tracking, functional magnetic resonance imaging (fMRI), and magnetocephalogram (MEG)
- Investigated the link between pupil size and fluctuations in brain activity using the Human Connectome Project (HCP) resting fMRI and eye-tracking/pupillometry dataset.

Neuroscience Thesis, Colgate University   **Aug.2021-May.2022**
Advisor: Bruce Hansen, PhD
Main Question: How do Behavioral Goals Shape the Spatiotemporal Evolution of Sparse Code for Scenes?
- Constructed a project focused on understanding how information is reduced in dimensionality in the visual system.
- Lead an Electrocochleogram (EEG) lab and asked participants to perform different tasks based on the scene they were viewing.
- Investigated how the visual system compresses information to explain goal-driven behavior to provide important insight into how the system encodes such a high-dimensional world to contribute a behavioral response.

Summer Research Fellow, Colgate University   **May 2021-July 2021**
Advisor: Bruce Hansen, PhD
Main Aim: Can Electrocochleogram be incorporated into a Sparse Coding Network?
- Collaborated on a project focused on understanding the geometry of how images are represented in the brain by mapping different image responses in a neural state-space and calculating the variance between them.
- Developed a new approach for understanding information representation of natural images in the human brain.

Applied Math Thesis, Colgate University   **Jan. 2021-May 2021**
Advisor: Ahmet Ay, PhD
Main Question: Can neural oscillations decode charismatic and non-charismatic perceptions of individuals?

- Applied multiple computational methods to investigate if certain brain wave oscillations could be predictors of charismatic or non-charismatic perceptions of other people to explore possible neurological explanations for this behavior.
- Developed machine learning techniques such as random forest, support vector machine and recurrent neural networks to classify participant's responses and investigate which features found by the algorithm may be the most predictive for perceiving charisma.

Awards and Honors

- **OITE Travel Award Recipient.** (September 2023). Competitively awarded $1000 from the NIMH to use towards conference-related travel. Bethesda, MD/Washington DC, USA.
- **Finalist – Three Minute Talks National Institute of Mental Health.** (September 2023). Selected as a finalist in the NIMH Three Minute Talks competition. Bethesda, MD/Washington DC, USA.
- **Outstanding Poster NIH PostBac Poster Day.** (April 2023). Presented a poster that was judged to be among the top 20% of all PostBac IRTA posters. Bethesda, MD, USA.
- **Dean's Award Recipient.** (4 semesters). GPA maintained over a 3.30 for that semester. Colgate University, Hamilton, NY, USA.
- **Dean's Award with Distinction.** (3 semesters). GPA maintained over a 3.60 for that semester. Colgate University, Hamilton, NY, USA.
- **Gold Award Recipient.** (Spring 2018). Organized a local art gallery focused on the de-stigmatization of anxiety and depression. Girl Scouts of West Central Florida, Tampa, Florida, USA.

Teaching Experience

NEUR 374 - Computational Neuroscience, Colgate University   **Aug. 2020-Dec. 2021**
- Communicated with 12 students five days a week for three months with topics such as the Hodgkins-Huxley model, leaky-integrate and fire, Izhikevich neurons and neural networks facilitating a better understanding for these complex topics.
- Spent 1-8 hours a week guiding Matlab (Mathworks, Inc.) scripting and visualizing concepts for homework assignments to clarify coding logic and to help students turn in more complete assignments.

COSC 208 - Intro to Computer Systems, Colgate University   **Jan. 2020-Dec. 2021**
- Aided students with concepts relating to operating systems, such as reading assembly code, writing/reading C, multiprocessing, and networking.
- Assisted 30 students during class hours three times a week with practice problems through Formative to better student understanding of logic and concepts.
- Aided two 3-hour labs in problem-solving their weekly coding assignments, which involved being able to decipher student's code, debug potential errors, and provide insight into how to proceed with a problem.

Leadership and Service

Program for Advancing the Health Sciences (PATHS) Mentor   **Oct. 2023-Present**

- Mentored students at least twice a month online in Fairfax County public high schools who want to pursue education in STEM.

President - Colgate Active Minds   **May 2020-May 2022**
- Worked with major campus organizations such as Shaw Wellness Institute and Student Government Association to execute events such as 13 Days of Wellness to raise awareness about mental health topics and well-being.

Member - Colgate Curling   **Aug. 2018-May 2022**
- Devoted four hours a week to practice and traveled with team across the northeast playing bonspiels to be eligible for nationals each year as well as creating fundraising merchandise.

Ciccone Commons Board Member, Colgate University   **Sep. 2018-May 2020**
- Planned events with board members, such as talent shows and field days, to promote a sense of community in our commons.

Computational Skills

- Matlab, Java, Python, C, AFNI, WEKA, PsychoPy, Adobe Illustrator, Tcsh, BASH, Certified in Microsoft Office (Word, PowerPoint, Excel) (proficient)

Poster and Oral Research Presentations

1. **Gobo, V.E.**, Gonzalez-Castillo, J., Teves, J., Holness, M., Bandettini, P.A., & Kronemer, S.I. (November 2023). *Pupil size and phase as a real-time marker of perceptual sensitivity and whole brain activity.* Poster presented at Society for Neuroscience, Washington, DC, USA
2. Kronemer, S.I., Holness, M., Morgan, T., Gonzalez-Castillo, J., Akin, B., Huber, R., **Gobo, V.E.**, Teves, J., Handwerker, D.A., Bandettini, P.A. (November 2023). *Perceptually-matched images and afterimages share whole brain fMRI dynamics.* Poster presented at Society for Neuroscience, Washington, DC, USA
3. **Gobo, V.E.**, Gonzalez-Castillo, J., Teves, J., Holness, M., Bandettini, P.A., & Kronemer, S.I. (September 2023) *Real time pupil size detection as a marker of arousal state and perceptual sensitivity.* Poster presented at the National Institute of Mental Health Fellowship Training Day, Washington DC, USA.
4. **Gobo, V.E.**, Gonzalez-Castillo, J., Teves, J., Holness, M., Bandettini, P.A., & Kronemer, S.I. (July 2023). *Real time pupil size detection as a marker of arousal state and perceptual sensitivity.* Poster presented at Organization for Human Brain Mapping, Montreal, CA
5. **Gobo, V.E.**, Gonzalez-Castillo, J., Teves, J., Holness, M., Bandettini, P.A., & Kronemer, S.I. (June 2023). Pupil size as a real-time marker of arousal and perception state. Poster presentation at Association for the Scientific Study of Consciousness. New York City, New York, USA.
6. **Gobo, V.E.**, Gonzalez-Castillo, J., Teves, J., Holness, M., Bandettini, P.A., & Kronemer, S.I. (April 2023). *Pupil Size as a real-time indicator for arousal and perceptual states.* National Institutes of Health Postbac Poster Day, Bethesda, MD, USA.
7. **Gobo, V.E.,** Gonzalez-Castillo, J., Teves, J., Holness, M., Bandettini, P.A., & Kronemer, S.I. (April 2023). *Pupil Size as a real-time indicator for arousal and perceptual states.* National Institutes of Mental Health Axelrod Symposium, Bethesda, MD, USA.

8. Hansen, B. C., Greene, M. R., Field, D. J., Gephart, I. S., & **Gobo, V. E.** (May 2022). *How do behavioral goals shape the spatiotemporal evolution of the sparse code for scenes.* Poster Presented at Visual Science Society, St. Pete Beach, FL, USA.
9. **Gobo, V.E.**, Hansen, B. C. (May 2022). *Brain-Supervised Sparse Reconstruction of Goal-Driven Perceptual Representations.* Poster Presented for Neuroscience Thesis at Colgate University, Hamilton, New York, USA.